REMARKS

In a non-final Office Action dated July 31, 2007 the Examiner in charge of this case rejected the claims of this application for a variety of reasons. Claims 1-8 and 12 are currently pending in the application; Claims 4-8 are withdrawn from consideration as being directed to a non-elected invention; Claims 1-3 and 12 are rejected under 35 U.S.C. §112, 1st ¶. Applicants respond by submitting the amendments above and remarks below, a Declaration from Dr. Susanne Clee under 37 CFR 1.132, and a Supplemental Information Disclosure Statement. Based on this response, reconsideration of the merits of this patent application is respectfully requested.

Claim Amendments

Claims 1 and 2 are rewritten as screening methods to identify a specific mutation in the nucleotide position and the amino acid position of the human SorCS1 sequence relative to the reference SEQ ID NOs: 3 and 4, respectively, wherein the difference is associated with susceptibility to type 2 diabetes. Support for these amendments is found, for example, at page 2, ¶9; page 3, ¶15, lines 5 and 22; page 4, ¶18; page 5, ¶19; and page 6, ¶25 of the specification. No new matter is added.

Claims 3-12 are cancelled without prejudice and applicants reserve the right to pursue prosecution of these claims in a continuing-type application. In view of these amendments, applicants respectfully request reconsideration and withdrawal of the rejections issued in this case.

New Matter Objection

The Office Action provides that amending the cDNA and the amino acid position in the 2nd and 3rd rows of Table 1 at page 4 of the specification constitutes new matter. Applicants submit that the amended claims do not relate to the subject matter disclosed in rows 2 and 3 of Table 1. In response, applicants submit that the clarifying amendments to rows 2-3 are of no consequence to the claimed invention, as the claims only pertain to the mutations disclosed in row 1 of Table 1. The newly amended claims relate to the human SorCS1 nucleotide position 163 (corresponding to mouse SorCS1 nucleotide position 172 , recited in 1st row of Table 1, due to the 9 extra nucleotide bases in the untranslated region). Both the nucleotide at position 163 in

the human SorCS1 sequence and the nucleotide at position 172 in the mouse SorCS1 sequence correspond to amino acid position 52 located in the 1st row of Table 1.

Further, one skilled in the art would have recognized the existence of the error and the appropriate correction. Applicants amended the nucleotide and amino acid positions at rows 2 and 3 of Table 1 only in the interest of sequence accuracy and completeness. Therefore, to facilitate a speedy allowance, applicants stand ready and willing to retract the alleged new matter from rows 2-3 of Table 1 should the Examiner require.

A new matter rejection was also issued against the amino acid position in the 1st row of Table 1 (Amendment filed 8/15/06) because allegedly the amino acid position "50" was changed to "52" without support in the specification. Applicants vigorously maintain that this amendment is not new matter. Applicants' argument is supported by both the specification as filed and the enclosed Declaration of Dr. Susanne Clee, who has worked for 12 years in the field of genetics of complex diseases, specializing in diabetes.

In the Declaration at paragraph 4, Dr. Clee describes in detail the information that was available and recited in the specification at the time of filing. This includes the mouse SorCS1 nucleotide sequence, GenBank Accession No. AF195056 (copy enclosed with Dr. Clee's Declaration as Exhibit B; and see specification pg. 6, paragraph 25, last line); the human SorCS1 nucleotide sequence, GenBank Accession No. NM_052918 and amino acid sequence, GenBank Accession No. NP_443150 (copy enclosed with Dr. Clee's Declaration as Exhibit C; and see specification pg. 5, paragraph 19); the Sequence Listing in the specification includes SEQ ID NO. 3 (human SorSC1 nucleotide sequence, which discloses that the 5'untranslated region (UTR) is 8 nucleotides in length): and SEQ ID NO. 4 (human SorSC1 amino acid sequence, which discloses a Thr (ACC) at position 52, but not position 50 (Ala)); and Figure 2A-H, which provides an amino acid sequence alignment for mouse SorCS1a, b, c (SEQ ID NOs: 11-13) and human SorCS1 (SEQ ID NO: 14).

In view of the specification as a whole, Dr. Clee explains that a person of ordinary skill in this art would have immediately recognized the numbering error, at amino acid position 52 in Table 1, and its appropriate correction. Specifically, at paragraph 9 of the Declaration, Dr. Clee asserts that one skilled in the art would immediately recognize that the amino acid position 50 is clearly wrong because the published mouse SorSC1 sequence has a 5'UTR that is 17 nucleotide in length, and the total length from the beginning of the 5'UTR

to the substituted nucleotide in the amino acid in question is 172 nucleotides long. In mouse SorSC1 the coding sequence from the 1st nucleotide of the 1st amino acid to the substituted nucleotide in the amino acid in question is 155 nucleotides. The difference between 149 and 155 is 6 nucleotides which would immediately alert one skilled in the art that the difference is 2 amino acids, making the position of the amino acid in question "52" not "50."

Clearly, Applicants' amendment simply corrected an obvious error in Table 1. Applicants submit that the change in amino acid position from "50" to "52" is supported in the specification through express, implicit, and inherent disclosure. As in this case, an obvious error does not constitute new matter where one skilled in the art would not only recognize the existence of the error in the specification, but also recognize the appropriate correction. *In re Oda*, 443 F.2d 1200, 170 USPQ 268 (CCPA 1971).

Further at paragraph 11 of the Declaration, Dr. Clee argues that even if for the sake of argument, one skilled in the art were to put "50" in the first row, column 4 of Table 1, as the amino acid that contains the substitution in the 2nd nucleotide, the coding sequence from the 1st nucleotide of the 1st amino acid to the substituted nucleotide in the amino acid in question would be 149 nucleotides. One skilled in the art would immediately recognize that the number "50" is a sequence error because 1) the published mouse SorSC1 sequence has a 5'UTR that is 17 nucleotides in length, and 2) the total length from the beginning of the 5'UTR to the substituted nucleotide in the amino acid in question is 172 nucleotides long. Therefore, the coding sequence from the 1st nucleotide of the 1st amino acid to the substituted nucleotide in the amino acid in question is 155 nucleotides.

The difference in the number of nucleotides between 149 and 155 is 6. One skilled in the art would immediately recognize this difference of 6 nucleotides translates into a difference of 2 amino acids. This makes the location of the amino acid in question "52" not "50". Following this logical analysis, there is no doubt that the amino acid position corresponding to nucleotide 172 of the SorCS1 sequence is "52" and not "50". The appropriate correction would have been immediately obvious to one of ordinary skill in the art at the time of filing. Therefore, applicants respectfully request withdrawal of the new matter rejection.

Claim Rejections - 35 USC §112, 2nd paragraph

Claims 2 and 12 are rejected for being indefinite. The amended claims herein above recite the specific SorCS1 human nucleotide position (i.e., 163 with reference to SEQ ID NO:3). Therefore, applicants believe that they have addressed the Examiner's §112 rejection, second paragraph and that this rejection is now moot.

Claim Rejections - 35 USC §112, 1st paragraph

Claims 1-3 and 12 are rejected as failing to comply with the enablement requirement. The Office Action provides that the nature of the invention requires the knowledge of predictive associations between the identified sequence variation at nucleotide position 172 (amino acid position 52) and susceptibility to developing Type 2 diabetes. The Action goes on to indicate that the specification provides no teaching or guidance as to the role of critical amino acids in any of the isoforms of either murine or human SorCS1. The Action further provides that there is no predictable association that any alteration in any protein coding region or cDNA of the mouse or human SorCS1 gene is diagnostic of susceptibility to developing Type 2 diabetes.

Contrary to the remarks in the current Office Action, applicants have established that there is a predictable association between mouse and human SorCS1 gene. Indeed, there are two recent publications co-authored by Drs. Alan Attie and Susanne Clee (inventors) demonstrating that the genetic findings in the mice SorCS1 gene translates to the same diabetes susceptibility gene in humans. (See Susanne Clee and Alan Attie, "The Genetic Landscape of Type 2 Diabetes in Mice," Endocrine Reviews 28:48-83 (2007); and Goodarzi, M.O., et al, "SORCS1: A Novel Human Type 2 Diabetes Susceptibility Gene Suggested by the Mouse," Diabetes 56:1922-1929 (2007), both disclosed in the Supplemental Information Disclosure Statement provided herewith). Therefore, in regards to the SorCS1 gene, a predictable association has been established between mice and humans.

While applicants neither agree nor acquiesce to the Examiner's characterization of the specification and claims, to expedite prosecution on the merits, applicants have amended Claims 1- 2 to clarify the nature of the invention. As such, Claims 1 and 2 are rewritten to include screening methods rather than diagnostic methods. Claims 1 and 2 are amended to screen for a variation in the nucleotide at position 163 corresponding to a variation in the amino acid at position 52 of the human SorCS1 sequence relative to the reference SEQ ID NOs: 3 and 4,

respectively, to determine whether the claimed sequence variation is associated with susceptibility to Type 2 diabetes in humans. Further, applicants have elected to cancel Claims 3-12 in the interest of expediting prosecution on the merits of the invention and reserve the right to and intend to file a continuation-type application to separately prosecute these claims. Applicants believe that they have addressed the Examiner's enablement rejection and that this rejection is now moot.

Next, Claims 1-3 and 12 are rejected as lacking written description. The Action provides at the top of page 18 that the specification does not appear to set forth diagnostic methods for diabetes susceptibility in humans by determining any particular mutation or position. As noted above, while not acquiescing with the Examiner's characterization of the specification and claims, applicants have amended Claims 1- 2 to clarify the nature of the invention as a screening method rather than a diagnostic method.

The Examiner also reiterates that the recitation of amino acid "52", in Table 1 is not supported by the specification. As discussed above, applicants believe that the amendment to the amino acid position in row 1 of Table 1 is not new matter because the initial error and the appropriate correction would have been immediately recognizable to the skilled researcher. Further, applicants believe that with the Declaration of Dr. Clee the Examiner's written description rejection is clearly and convincingly addressed. As such, this rejection should be withdrawn.

Accordingly, applicants respectfully request that in view of these claim amendments and comments, the rejection be reconsidered, withdrawn and that a timely Notice of Allowance be issued in this case.

Summary

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone applicants' attorney at the number listed below so that such issues may be resolved as expeditiously as possible. For the reasons stated above this application is now considered to be in condition for allowance and such action is earnestly solicited.

Fees

A Petition for Extension of Time accompanies this response so the response will be deemed timely filed. Also enclosed is a Supplemental Information Disclosure Statement. Please charge these fees to Deposit Account No. 17-0055. No other fees are believed due. However, if any other fee is due or any other extension of time is required in this or any subsequent response, please consider this to be a petition for the appropriate extension and a request to charge the petition fee to the Deposit Account No. 17 0055.

Respectfully submitted,

Sara D. Vinarov
Reg. No. 48,524
Attorney for Applicants
QUARLES & BRADY LLP
P.O. Box 2113
Madison, WI 53701-2113

TEL 608/251-5000
FAX 608/251-9166